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ABSTRACT

An investigation of learning styles appropriate for traditional and non-traditional styles is presented. Identification of learning styles that contribute to the learning process in the classroom for students is important for educators in assisting them to achieve their professional goals. The learning styles measured are print, aural, interactive, visual, haptic, kinesthetic, and olfactory. The study worked with 135 undergraduate and graduate students enrolled in classes in the education department of a medium-sized, midwestern university. The Perceptual Learning Style Inventory was used to determine learning style preferences. The results show the hypothesis of a significant difference between traditional and non-traditional students was not supported with the between group analyses. However, when rank-ordered, the kinesthetic style was higher in the traditional group than the non-traditional group. It is recommended that this study be repeated with a larger, more generalized population. Three tables are included. Contains 5 references. (SM)

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A COMPARISON OF LEARNING STYLES IN TRADITIONAL AND NON-TRADITIONAL STUDENTS

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ABSTRACT

Identification of learning styles that contribute to the learning process in the classroom for students is important for educators in assisting their professional goals. The primary aim of this article was to investigate learning styles which were appropriate for traditional and non-traditional learners. The learning styles measured are as follows: print, aural, interactive, visual, haptic, kinesthetic, and olfactory. A total of 135 undergraduate and graduate students from a medium sized university were utilized as subjects. The study indicated no significant difference between traditional and non-traditional students when using a between group analyses. However, when rank orders were calculated the kinesthetic style was ranked higher by the traditional group. These results are discussed with regard to limitation of the study and instrument as well as implications for future research.

A COMPARISON OF LEARNING STYLES IN TRADITIONAL AND NON-TRADITIONAL STUDENTS

The primary aim of this study was to investigate learning styles which were appropriate for traditional and non-traditional learners.

Before identifying learning styles, it appears that a definition for traditional and non-traditional students is needed. Traditional students are individuals who have entered college after high school and who have not attained the age of 25. Non-traditional students are individuals who have attained the age of 25 and have not completed his/her educational goals.

In recent years there has been increasing evidence which shows that all people do not learn in the same way. Some psychologists say learning is a relatively permanent change in behavior or knowledge that occurs as a result of experience. For some, learning is defined as a change in behavior -- the behaviorists take this position. For others, learning is personal development; for still others, it is developing the mind. Many talk about learning as the accumulation of knowledge, and still others talk about learning as a problem-solving activity. A common element in all the various definitions of learning is change. A person who has learned is somehow different from what he or she was before the learning took place. The change may be a new idea the learner has acquired or even a

new way of understanding an old idea. The person who has learned may now have a new skill he or she can perform, or a new insight gained from solving a problem (Apps, 1981).

Many teachers often teach students to learn information in a way which has proven effective and successful for the teacher. When teachers instruct students in learning modes which are not right for them, it creates artificial stress, reduces motivation, and restricts performance. Each person has a unique way of learning and developing strategies that can be transferred from one situation to comparable situations. However, the essential act performed by the teacher is to assess the different learning styles of the students enrolled in the class. There are several methods that can be used to perform this assessment.

One of the apparently simple, yet actually one of the more complex procedures, for assessment involves simply observing the learners and determining which technique of teaching produces the greatest gains in test scores. One problem with this technique is that the teacher often fails to observe the students closely enough to make an accurate assessment. Another problem is that the semester is often completed by the time the instructor has discovered that some of his/her students do not learn effectively. This can only be done by maintaining close and frequent contact with the students, and by varying the teaching strategies until a "happy medium" is obtained; one that seems to meet the needs of the majority of the individuals.

A second method of assessing the learning styles of the class members is through the use of an interview. Providing that time permits, the adult education teacher could individually interview the class members and ask pertinent questions concerning successes and failures in formal learning settings. Using the information obtained from the interviews, the teaching strategies employed during the semester could include those that would reach the greatest number of students.

A third method of assessing individual styles of learning would be through the use of a printed, formal assessment inventory, such as the Learning Styles Inventory (Educational Activities, Inc.: Freeport, New York). The inventory can be administered to the entire class at the same time. When completed, the teacher has a picture of the individual student's learning style and a picture of the style of the majority of the class. Thus, teaching strategies can be developed and employed that will reach the majority of the students and that will provide individual learning styles.

However, in order to understand learning styles more clearly, several theorists must be reviewed. First, Dunn and Dunn's (1979) learning style theory which has made considerable contributions in the field. Dunn and Dunn's theory of learning styles is based on four steps. They are as follows:

1. Environmental - how the learner responds to temperature, light, and design of facilities.

2. Sociological - how the learner learns in relation to other people.

3. Emotional - levels of motivation, persistence, and responsibility.

4. Physical - perceptual strengths, which include auditory, visual, tactile, kinesthetic, or combinations of these senses.

Another learning style which consists primarily of abstract and concrete learners is Gregorc's theory. He states four basic principles of learning. They include:

1. Abstract sequential learner - preference for learning in a rational sequential manner.

2. Abstract random learner - prefers an unstructured method of receiving instruction.

3. Concrete sequential learner - prefers learning in a rational sequential hands-on manner.

4. Concrete random learner - prefers to experiment and explore by trial and error.

The implications of these studies focus on learning styles and techniques.

However, the Perceptual Learning Style Inventory probably renders itself as one of the most effective instruments (Galbraith and James, 1985). It is composed of a series of elements that together make up each person's unique style of learning. It divides perceptual styles into seven elements which are as follows: (1) print, (2) aural, (3) interactive, (4) visual, (5) haptic, (6) kinesthetic, and (7) olfactory. To explain these elements of perceptual learning style, each element is presented and described separately.

1. Print--This person usually tends to learn best through seeing words in books, chalkboard in charts, or in workbooks.

2. Aural--A person who generally learns best through listening. These individuals may learn best through lectures, and audio tapes.

3. Interactive--Individual who learn best through verbalization. These people like to discuss, act, debate, and interact with other members of the class.

4. Visual--A person who learns by observation. These people like visual stimuli such as pictures, slides, graphs, etc.

5. Haptic--Individuals who learn best through the sense of touch. A haptic person assimilates information through a "hands on" approach to learning.

6. Kinesthetic--A person who learns best through activity. This is someone who constantly has to be moving while in the process of learning.

7. Olfactory--Individuals who learn best through the sense of smell and taste.

The perceptual learning style model developed by Galbraith and James helps teachers choose the appropriate style, and therefore, results in achievement and motivation for students. Prescriptive information such as kinds of materials and methods of delivery can be correlated with a particular style. Therefore, discrepancies in learning that exist between the student and the teacher can be reduced. Increased learning can take place, and the quality of learning can be improved.

With the Perceptual Learning Style Inventory in mind, this study was designed to assess whether or not different learning styles existed for traditional and non-traditional students as previously defined.

It was hypothesized that the ranking of the seven Learning Styles would differ between traditional and non-traditional students.

Method

Subjects

Subjects for the study were 135 undergraduate and graduate students enrolled in classes in the education department of a medium-sized, midwestern university. Students in two basic educational psychology classes and students in administrative classes were inventoried.

Materials

The Perceptual Learning Style Inventory (Galbraith & James, 1985) was the inventory chosen to determine learning style preferences. According to Galbraith and James (1985), it is one of the most effective instruments. The Perceptual Learning Style Inventory is composed of a series of elements that together make up each person's unique style of learning. It divides styles into seven elements: (1) print, (2) aural, (3) interactive, (4) visual, (5) haptic, (6) kinesthetic, and (7) olfactory. To explain these elements of perceptual learning style, each element is presented and described separately. Attached to the instrument was a note with a place for each student to check whether they were under 25-years-old or over 25-years-old and whether they were male or female.

Procedure

The Perceptual Learning Style Inventory was distributed in

the individual classrooms by their professors and students were asked to fill it out. Confidentiality was assured. The inventory took students about 10 minutes to complete. Inventories were them collected and the data and the demographics were analyzed.

Results

Data from the survey instrument were collected from a total of one hundred and thirty-five students. Ninety-five were female and seventy were over twenty-five years of age. The raw scores on each learning style were converted to percentages based upon the number of items for each style for comparison purposes. Table 1 below shows the average percentage scores for each style broken down by gender and age.

Table 1

Learning Style Percentage Scores by Gender and Age

Learning	Gender		Age	
Style	Male	Female	< 25	> 25
Visual	43.59	48.42	41.93	50.00
Aural	30.77	34.74	29.03	35.71
Interactive	56.41	67.37	62.90	65.71
Print	41.03	38.95	37.09	41.43
Kinesthetic	28.20	36.84	41.93	27.14
Haptic	33.33	29.47	27.42	32.86
Olfactory	2.56	10.53	8.06	7.14

These percentage scores were analyzed for between group differences for each style for both gender and age. None of the fourteen Mann-Whitney U Tests were significant at the .05 level. However, when the data were analyzed for ranking differences, significant results were obtained.

Four Friedman ANOVA's for dependent, nonparametric data were performed. The first two analyses revealed significant differences in learning style rankings for both males and females. The chi-square value (this distribution is utilized for determining significance) for the males was 17.154 ($df = 6$, $p = .009$), and for the females 45.174 ($df = 6$, $p = .001$). These results are illustrated in Table 2 below.

Table 2

Learning Style Rankings From Highest to Lowest by Gender

Males	Females
Interactive	Interactive
Visual	Visual
Print	Print
Haptic	Kinesthetic
Aural	Aural
Kinesthetic	Haptic
Olfactory	Olfactory

Follow-up Friedman ANOVA's between each pair of learning styles for each group indicate that the significance of the

ranking differences is related to the very low ranking of the Olfactory Style for both males and females, and the very high ranking of the Interactive Style for the females.

The next two analyses were performed on the learning style rankings of both the below and over 25 years of age groups. Both chi-square values were significant at the .05 level. For the below 25 years of age group $X2 = 27.605$, $df = 6$, $p = .001$; and, for the above 25 years of age group $X2 = 37.125$, $df = 6$, $p = .001$. Table 3 shows the learning style rankings of these two age groups.

Table 3

Learning Style Rankings from Highest to Lowest by Age

Below 25	Above 25
Interactive	Interactive
Visual	Visual
Kinesthetic	Print
Print	Aural
Aural	Haptic
Haptic	Kinesthetic
Olfactory	Olfactory

Follow-up analyses revealed that these significant differences were again primarily related to the high ranking of the Interactive Style and the low ranking of the Olfactory Style. Additionally, the higher ranking given the Kinesthetic Style by

the younger age group was significant. This is indicated by a significant difference in ranking by the younger group of Kinesthetic vs. Olfactory, and the lack of a significant difference by the older group between the same two learning styles.

Discussion

The hypothesis of a significant difference between traditional (<25) and non-traditional (>25) students was not supported with the between group analyses. However, when rank-ordered the kinesthetic style was higher in the traditional group than the non-traditional group. Although this conclusion is limited by the utility of the survey instrument, it is recommended that university instructors of traditional students (those under 25) should provide some kind of kinesthetic activity in the classroom. Other observations that can be made are that the interactive and visual style are the top two ranking learning styles for both traditional and non-traditional students. Professors should realize students' need to verbalize while learning and that it is important to allow discussion, debate and interaction with members of the class for quality learning to occur. Visual stimuli such as overheads, pictures, graphs, slides, and films, also are important in the classroom and provide students a chance to learn by observation.

One weakness of the instrument is that apparently it was primarily designed for classroom use to obtain prescriptive

information such as kinds of materials and methods of delivery which would be appropriate for a particular style. The inventory has no norms, therefore scoring was in a nonparametric form only. In future studies the researches strongly recommend using a different inventory or instrument.

The researchers suggest that results of this study can be generalized only to similar populations. It is recommended that the study be repeated with a larger, more generalized population in terms of age and geographic distribution.

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